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TRANSMITTAL LETTER OF THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		Attorney Docket No. <u>2510-1001</u>
		U.S. Application No. <u>101088475</u>
INTERNATIONAL APPLN. NO. <u>PCT/IT00/00304</u>	INTERNATIONAL FILING DATE <u>20 JULY 2000</u>	PRIORITY DATE CLAIMED

TITLE OF INVENTION: **SYSTEM FOR MAKING PURCHASES AT A SHOPPING CENTRE OF THE SELF-SERVICE TYPE**

APPLICANT(S) FOR DE/EO/US: **UMBERTO AVANZI**

Applicant herewith submits to the United States Designated Elected Office (DO/EO/US) the following items and other information:

1.  This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2.  This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3.  This is an express request to begin national examination procedures (35 U.S.C. 371(f)).  
The submission must include items (5), (6), (9) and (21) indicated below.
4.  The US has been elected by the expiration of 19 months from the priority date (Article 31).
5.  A copy of the International Application as filed (35 U.S.C. 371 (c)(2))
  - a.  is attached hereto (required only if not communicated by the International Bureau)
  - b.  has been communicated by the International Bureau. See attached PCT/IB/308.
  - c.  is not required, as the application was filed in the United States Receiving Office (RO/US).
6.  An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2))
  - a.  is attached hereto.
  - b.  has been previously submitted under 35 U.S.C. 154(d)(4).
7.  Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a.  are attached hereto (required only if not communicated by the International Bureau).
  - b.  have been communicated by the International Bureau.
  - c.  have not been made, however, the time limit for making such amendments has NOT expired.
  - d.  have not been made and will not be made.
8.  An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9.  An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10.  An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

**Items 11 to 20 below concern document(s) or information included:**

11.  Information Disclosure Statement (IDS) w/PTO-1449 -  Copy of IDS citations
12.  Assignment Papers (cover sheet & document(s))
13.  A FIRST Preliminary Amendment.
14.  A SECOND or SUBSEQUENT Preliminary Amendment.
15.  A substitute specification.
16.  A change of power of attorney and/or address letter.
17.  A computer-readable form of the sequence listing in accordance with PCT Rule
18.  A second copy of the published international application under 35 U.S.C. 154(d)(4).
19.  A second copy of the English language translation of the international application (35 U.S.C. 154(d)(4)).
20.  Other items or information: International Search Report, PCT/IB/308, Abstract of the Disclosure,

**Application Data Sheet**

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U.S. APPLICATION NO. <b>10/088475</b>	INTERNATIONAL APPLN. NO. PCT/IT00/00304	ATTORNEY DOCKET NO. 2510-1001
21. <input checked="" type="checkbox"/> The following fees are submitted:		CALCULATIONS PTO USE ONLY
<b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1)-(5):</b>		
Neither international preliminary examination fee nor international search fee paid to USPTO and international Search Report not prepared by the EPO or JPO ..... \$1040.00		
International preliminary examination fee not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$890.00		
International preliminary examination fee not paid to USPTO but International search fee paid to USPTO ..... \$740.00		
International preliminary examination fee paid to USPTO but all claims did not satisfy provision of PCT Article 33 (1)-(4) ..... \$710.00		
International preliminary examination fee paid to USPTO and all claims satisfied provision of PCT Article 33 (1)-(4) ..... \$100.00		
<b>ENTER APPROPRIATE BASIC FEE AMOUNT</b>		
\$ 890.00		
Surcharge of \$130.00 for furnishing the oath or declaration than <input checked="" type="checkbox"/> 20- <input type="checkbox"/> 30 Months from the earliest claimed priority date (37 CFR 1.492(e))		
\$ 130.00		
CLAIMS	NUMBER FILED	NUMBER EXTRA
Total Claims	13 - 20 =	0
Independent Claims	3 - 3 =	0
MULTIPLE DEPEND CLAIM(S) (if applicable)		+ \$280.00
<b>TOTAL OF ABOVE CALCULATION -</b>		
\$ 1,020.00		
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½.		
\$ 510.00		
<b>SUBTOTAL =</b>		
\$ 510.00		
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492Z(f)).		
\$		
<b>TOTAL NATIONAL FEE =</b>		
\$ 510.00		
Fee for recording the enclosed assigned (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) \$40.00 per property +		
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\$ 510.00		
Amount to be refunded		
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<input checked="" type="checkbox"/> A Check in the amount of <u>\$510.00</u> to cover all fees is attached.		
<input type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to Deposit account No. 25-0120 in the name of Young & Thompson, as described below. A duplicate copy of this sheet is enclosed.		
<input checked="" type="checkbox"/> The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fee required under 37 C.F.R. §§ 1.16 or 1.17		
<i>Thomas W. Perkins</i>		
SEND ALL CORRESPONDENCE TO: 745 South 23rd Street Arlington, VA 22202 Telephone (703) 521-2297 Y&T Customer No. 000466		
PATENT TRADEMARK OFFICE		
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TWP/ia		
Date: <u>March 20, 2002</u>		
SIGNATURE		
Thomas W. Perkins		
NAME		
33,027		
REGISTRATION NO.		

PATENT  
2510-1001

**IN THE U.S. PATENT AND TRADEMARK OFFICE**

In re application of: Umberto AVANZI

Appl. No.: **NEW** Group:

Filed: March 20, 2002 Examiner:

For: SYSTEM FOR MAKING PURCHASES AT A SHOPPING  
CENTRE OF THE SELF-SERVICE TYPE

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, DC 20231

March 20, 2002

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

**IN THE CLAIMS:**

Please cancel claims 1-14 without prejudice or disclaimer of the subject matter contained therein.

Please add the following claims:

--15. (new) A system for making purchases by a customer at a shopping centre of the self-service type, comprising means for storing the position of each product on sale in the centre, means for providing a shopping list of products to be purchased, means

for determining the position of each product to be purchased and means for providing the customer with an indication of the products to be purchased in an ordered sequence according to a path inside the centre.--

--16. (new) The system according to Claim 15, wherein the means for providing the customer with an indication of the products to be purchased include a portable processing device having means for displaying a name and a coordinate, inside the centre, of each product to be purchased.--

--17. (new) The system according to Claim 16, wherein the means for storing the position of each product on sale and the means for determining the position of each product to be purchased include a computer of the centre, the computer further comprising means for producing an ordered shopping list according to the path and comprising, for each product to be purchased, the corresponding name and the corresponding coordinate, and wherein the system comprises means for communication between the computer and the portable device, the ordered shopping list being sent from the computer to the portable device.--

--18. (new) The system according to Claim 16, wherein the portable device comprises means for displaying in succession the indication of each current product to be purchased in response to a forward command.--

--19. (new) The system according to Claim 18, wherein the portable device includes a bar-code reader for producing the

forward command in response to the reading of a bar-code for the current product to be purchased, chosen by the user.--

--20. (new) The system according to Claim 18, wherein the computer comprises means for storing a possible special offer associated with each product on sale and means for adding the corresponding special offer to each product to be purchased in the ordered shopping list, the portable device further displaying the special offer corresponding to the current product to be purchased.--

--21. (new) The system according to Claim 20, wherein the special offer includes a discount applied to a price of the product on sale and wherein the portable device comprises means for determining an amount saved equal to the sum of the discounts corresponding to the products to be purchased chosen by the user, the portable device further displaying the amount saved.--

--22. (new) The system according to Claim 15, wherein the computer comprises means for storing information relating to the customer and means for producing an additional list containing an indication of recommended products depending on the information relating to the customer, the additional list being sent to the portable device and the portable device further displaying the indication of the additional products.--

--23. (new) The system according to Claim 22, wherein the additional list includes, for each recommended product, the corresponding name and the corresponding coordinate and wherein

the system further comprises means for detecting a position of the portable device, the portable device displaying the indication and the coordinate of the recommended product when the portable device is in the vicinity of the corresponding position.--

--24. (new) The system according to Claim 15, further comprising signalling means for indicating a zone in which the current product to be purchased is located, the portable device comprising means for selectively activating the signalling means.-

--25. (new) A method for making purchases by a customer at a shopping centre of the self-service type, comprising the steps of:

storing a position of each product on sale in the centre,  
providing a shopping list of products to be purchased,  
determining the position of each product to be purchased  
and,

supplying the customer with an indication of the products to be purchased in an order sequence according to a path inside the centre.--

--26. (new) A computer program directly loadable into a working memory of a computer for performing a method of making purchases by a customer at a shopping centre of the self-service type, wherein the computer stores the position of each product on sale in the centre, the method including the steps of:

receiving a shopping list of products to be purchased,  
determining the position of each product to be purchased,  
and

providing the customer with an indication of the products to  
be purchased in an ordered sequence according to a path inside  
the centre.--

--27. (new) A program product comprising a computer  
readable medium on which the program of Claim 26 is stored.--

REMARKS

Claims 15-27 are pending in the present application.

Claims 1-14 have been cancelled and claims 15-27 have been added.

Entry of the above amendments is earnestly solicited.

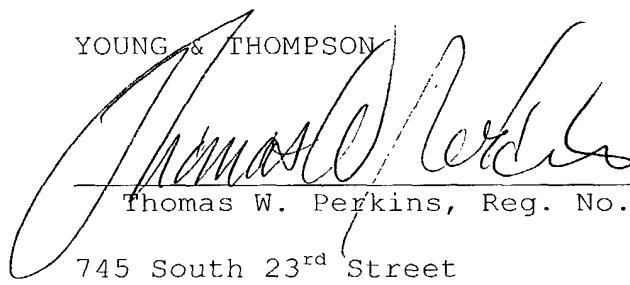
An early and favorable first action on the merits is earnestly requested.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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TWP/ia  
Attachments

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## DESCRIPTION

"System for making purchases at a shopping centre of the self-service type"

The present invention relates to a system for making 5 purchases at a shopping centre of the self-service type.

In shopping centres of the self-service type, the products are generally arranged on shelves which can be directly accessed by the customers. The customers serve themselves and then pay for the purchases made at a cash 10 till situated at the exit from the shopping centre.

A problem which is encountered by customers in these shopping centres, in particular if the latter are very large in size (as in the case of supermarkets), consists in the difficulty of identifying the position of each 15 product to be purchased. This problem becomes even greater in the case of customers who do not regularly frequent the shopping centre; however, this problem is also experienced by regular customers, for example whenever the arrangement of the products on sale is 20 varied.

A known solution consists in using signs which indicate, for each group of shelves, the category of products arranged on them. The signs are generally hung from the ceiling along a central corridor in the shopping 25 centre.

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This solution, however, is not particularly satisfactory. In particular, finding the products to be purchased in any case remains a difficult task for the customer, who is obliged to walk slowly around the shopping centre, looking upwards all the time in order to check the information shown on the signs. The product categories used must be necessarily generic, with the result that the customer is not always able to immediately associate the product to be purchased with the corresponding product category. Moreover, this system does not allow the position of certain products which do not fall within a well-defined product category to be identified.

These drawbacks result in a considerable amount of time being wasted by the customer in order to find the products to be purchased. Very frequently the customer realizes that he/she has forgotten one or more products only when in the vicinity of the shopping centre exit so that he/she is obliged to return to the entry area in order to look for these products. In some cases this even results in purchase of the forgotten products being abandoned by the customer. Moreover, the above mentioned difficulties constitute a significant obstacle which dissuades new customers from using the shopping centre.

It is an object of the present invention to overcome

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the above mentioned drawbacks. In order to achieve this object a system as indicated in Claim 1 is proposed.

In short, the present invention envisages a system for making purchases by a customer at a shopping centre 5 of the self-service type, comprising means for storing the position of each product on sale in the centre and means for providing a shopping list of products to be purchased; the system furthermore comprises means for determining the position of each product to be purchased 10 and means for providing the customer with an indication of the products to be purchased in an ordered sequence according to a path inside the centre.

Moreover, the present invention also proposes two corresponding methods for making purchases at the 15 shopping centre, as well as a computer program and a corresponding product program for implementing one of these methods under the control of a shopping centre computer.

Further features and the advantages of the solution 20 according to the present invention will be made clear by the following description of a preferred embodiment thereof, given purely by way of a non-restrictive indication, with reference to the accompanying figures in which:

25 Fig. 1 shows in schematic form the system for making

purchases,

Fig. 2 is an elementary block diagram of a palm-top computer supplied to a customer in a supermarket,

Fig. 3 shows the partial contents of a working memory of a host computer in the supermarket and of the palm-top computer during their operation,  
5

Figs 4a-4b show the flow chart of a method used for making purchases.

With reference in particular to Fig. 1, a system 100  
10 for making purchases at a supermarket 105 is shown. The supermarket 105 covers a large-size closed area (of the order of a few thousand square metres) which is accessed via an entrance 110.

The supermarket is provided with a series of shelves  
15 115 (for example some tens) arranged in pairs opposite each other. A wide range of products on sale in the supermarket 105 are arranged on the shelves 115 (for example food, hygiene, cleaning or similar products). The products on sale are packaged individually and have a  
20 label which provides information relating to the product (such as, for example, name, weight, date of expiry, etc.) and its price. Each shelf 115 is divided into several sectors (four in the example shown in the figure). A signalling lamp 118 and a radio transceiver  
25 119 are positioned above each sector of the shelves 115.

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The shelves are arranged so as to form a central corridor from which various lateral corridors extend opposite each other. Within the supermarket 105 it is thus possible to define a winding path 120 which, 5 starting from the entrance 110, passes in front of each shelf 115. A series of cash tills 125 (for example some tens) allows one to pay for the shopping and then leave the supermarket 105.

The supermarket 105 is equipped with a host computer 10. 130. The host computer 130 is connected by means of a cable to each of the cash tills 125. The computer is also connected via radio to a series of palm-top computers 135, each of which is supplied to a customer in the supermarket 105.

15 Similar considerations apply in the case of a hypermarket (or any other shopping centre of the self-service type) or in the case where the supermarket has a different structure, for example with the shelves arranged in another way and with a different path along 20 the shelves, etc.

With reference now to Fig. 2, the host computer 130, which is for example a mini-system, is formed of various units which are connected in parallel to a communications bus 205. In particular, a processor ( $\mu$ P) 210 controls the 25 operation of the host computer 130, a working memory 215

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(typically a DRAM) is used directly by the processor 210, and a read-only memory (ROM) 220 contains a basic program for starting the host computer 130. Various peripheral units are further connected to the bus 205 (by means of 5 respective interfaces). In particular, a mass memory consists of a hard disk 225 and of a driver device (DRV) 230 for reading/writing floppy disks 235. A program for managing the host computer 130 is stored on the hard disk 225; typically, the management program is distributed on 10 the floppy disk 235 so that it may be installed on the hard disk 225. Finally, the host computer 130 includes an input unit (IN) 240 which consists of a keyboard and a mouse, an output unit (OUT) 245 which consists of a monitor and a printer, and a radio transceiver 250 used 15 to receive and send messages to each palm-top computer 135.

Similarly, the palm-top computer 135 includes a bus 255 which has, connected to it, a microprocessor ( $\mu$ P) 260, a working memory 265 and a non-volatile memory 270 20 (typically a flash-type E<sup>2</sup>PROM), which contains a program for controlling the palm-top computer 135. The palm-top computer 135 is also equipped with a liquid-crystal display 275 with which an optical pen 280, a keyboard 285, a bar-code reader 290 and a radio transceiver 295 25 are associated.

Similar considerations apply in the case where the host computer and the palm-top computer have a different structure, for example the host computer is equipped with an optical disk (CD-ROM) reader, has a distributed 5 architecture, for example consisting of a personal computer (PC) network, or the palm-top computer is equipped with a touch-screen, and the like. Alternatively, the program for management of the host computer is supplied on a CD-ROM, is pre-loaded on the 10 hard disk or is stored on any other medium which can be read by a computer, is sent on a network to the host computer (for example via the Internet) or more generally is supplied in any form which can be directly loaded into the working memory of the host computer.

If we now consider Fig. 3, the partial contents of the working memory 215 of the host computer and of the working memory 265 of the palm-top computer during their operation are shown; this information (programs and data) is typically stored on the hard disk or in the E<sup>2</sup>PROM, 20 respectively, and loaded (at least partly) into the working memory during execution, in addition to an operating system and any other application programs (not shown in the figures).

The working memory 215 of the host computer includes 25 a driver module (DRV) 310 which physically manages the

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transmission, via radio, of the information with each palm-top computer. The driver module 310 communicates with a supermarket-management module (DW) 315 and with a shopping-management module (SHP) 320. The supermarket-  
5 management module 315 controls a customer database 325 and a product database 330 to which the shopping-management module 320 has access. An acquisition module 335 controls the entry of information relating to new customers in the database 325.

10       The customer database 325 consists of a table of the relational type which contains a record for each customer (accessible via an identification code associated with said customer). The record is composed of a field (CL) which contains information identifying the customer (such  
15      as name, age, profession, serial number of the respective palm-top computer, and the like) and a field (LOG) which contains a log of the purchases made by the customer during a predefined period (for example during the last year).

20       Similarly, the product database 330 consists of a table which contains a record for each product on sale in the supermarket. The record is composed of a field (PRD) which contains information identifying the product, such as the product type, the brand, the product bar-code (in  
25      EAN or UPC format or a format specific to the

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supermarket), and the selling price, a field (POS) which contains a coordinate identifying the position of the product in the supermarket, and a field (DL) which contains an indication of special offers associated with  
5 the product, together with any discount applied to the selling price. The coordinate which identifies the position of the product consists of a progressive number assigned to the shelve (along the path from the entrance to the cash tills), a sector number and a level number.

10       The working memory 265 of the palm-top computer includes a driver module (DRV) 345 which physically manages the transmission, via radio, of the information with the host computer. The driver module 345 has access to an array 350 which contains a shopping list SL; the  
15      driver module 345 controls the contents of two additional arrays 355 and 360 which contain, respectively, an ordered shopping list SSL and a list of special offers AD, and controls the contents of a position variable (POS) 363.

20       A display module 365 has access to the ordered-shopping-list array 355, the special-offers-list array 260 and the position variable 363. The display module 365 communicates with an input module 370 (which drives the optical pen and the keyboard of the palm-top computer)  
25      and with a module for driving the bar-code reader 375;

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the input module 370 controls the contents of the shopping-list array 350. The display module 365 also controls an amount-spent variable (TOT) 380. An output module 385 (which drives the display of the palm-top computer) communicates with the display module 365 and has access to the amount-spent variable 380.

Similar considerations apply in the case where the programs and the data are structured differently, are stored on different processing systems or other functions 10 are envisaged, and the like.

In order to explain the operation of the system described above, reference is now made to Figs 4a-4b (together with Fig. 3). When a customer wishes to make purchases at the supermarket, a series of routines which 15 overall form a method 400 are carried out in successive time periods. The method 400 starts with step 405 and then passes to step 410 where the customer (at his/her own home) writes the name of each product to be purchased on the display of the palm-top computer using the respective optical pen. The text thus entered is analysed 20 by a character-recognition program of the input module 370 and, if the name is included in a predefined list, the product is added to the shopping-list array 350.

When the customer arrives at the supermarket, he/she 25 fixes the palm-top computer onto a shopping trolley and

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then activates, by means of a corresponding key on the palm-top computer, communication with the host computer. The method then passes to step 420 where the driver module 345 transmits the serial number of the palm-top 5 computer (read from the E<sup>2</sup>PROM) and the shopping list SL to the driver module 310, which directly supplies this information to the shopping-management module 320.

Passing on to step 423, the shopping-management module 320 determines the customer associated with the 10 serial number (from the respective field CL of the customer database 325). The shopping-management module 320 then produces an additional list of recommended products for the customer. In particular, the additional list contains the name of the products usually purchased 15 by the customer (obtained from the contents of the respective field LG of the customer database 325) and not included in the shopping list SL; the additional list also contains the name of the products on special offer (obtained from the contents of the fields DL of the 20 product database 330) which may be of interest to the customer (determined on the basis of the personal details of the customer, obtained from the respective field CL of the customer database 325).

If we now consider step 425, the shopping-management 25 module 320 obtains (from the respective fields POS and DL

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of the product database 330) the coordinate and any special offer (together with the corresponding discount) associated with each product to be purchased included in the shopping list SL and with each recommended product 5 included in the additional list. The shopping list and the additional list thus modified are then arranged in order, in step 430, according to the path inside the supermarket (from the entrance to the cash tills), so as to obtain the corresponding ordered shopping list SSL and 10 the corresponding list of special offers AD.

The method then proceeds to step 435 where the ordered shopping list SSL and the list of special offers AD are supplied to the driver module 310 which transmits them to the corresponding driver module 345; the driver 15 module 345 stores the ordered shopping SSL and the list of special offers AD in the array 355 and array 360, respectively. Passing to step 437, the position variable 363 is set to a predefined value associated with the supermarket entrance and the amount-spent variable 380 is 20 set to a zero value both as regards the total purchase amount and as regards the total savings resulting from the discounts. The total purchase amount and the total savings are then shown to the customer on the display of the palm-top computer by the output module 385.

25 Continuing to step 440, the palm-top computer

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determines its current position inside the supermarket (and therefore also the position of the customer). In particular, each transceiver arranged on the shelves continuously transmits a signal indicating its position; 5 this signal is transmitted selectively to the respective corridor within a radius of a few metres (for example 2 metres), so as not to interfere with the signals transmitted by the other transceivers. The driver module 345 checks whether a signal sent by the transceivers is 10 available; if this is the case, the driver module 345 correspondingly updates the position variable 363.

The method then proceeds to step 450, where the display module 365 determines the product in the ordered list SSL or the list of special offers AD which is 15 closest, along the path inside the supermarket (in both directions), to the current position of the palm-top computer (by means of a comparison between the respective coordinates and the position variable 363). The name, the coordinate and any special offer associated with the 20 current product thus determined are extracted from the ordered-shopping-list array SSL or from the special-offers-list array AD and sent to the output module 385 so as to be shown on the display of the palm-top computer. In the case where the current product is included in the 25 list of special offers AD (and not in the ordered

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shopping list SSL), this information is displayed in a different format (for example with the addition of a flashing advertisement reminding the user of the opportunity to purchase the recommended product).

5       The method then passes to step 460 where different operations are carried out in response to any action performed by the customer.

In particular, if the customer has not performed any action, the method returns directly to step 440.

10       If, however, the customer has selected a request for signalling the position of the current product (by means of a corresponding key on the palm-top computer), the method passes to step 465 where the coordinate of the current product is supplied to the driver module 345 which transmits a corresponding signal within a radius of 15 10 metres or so. Each transceiver arranged on the shelves and receiving this signal checks whether the coordinate of the current product falls within its sector; if this is so, the transceiver activates (for a few seconds) the associated signalling lamp. The method then returns to 20 25 step 440.

If the customer has chosen the product to be purchased, this product is removed from the shelf and the bar code shown on its packaging is read by means of the reader of the palm-top computer in step 470. The bar-

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code-reader driver module 375 sends the value read to the display module 365 which correspondingly updates the ordered-shopping-list array 355 or the special-offers-list array 360. At the same time, the total purchase amount and the total savings in the amount-spent variable 380 (which are shown to the customer on the display of the palm-top computer) are also updated. The method then passes to step 480 (described below).

If the customer has decided not to purchase the current product and to erase it from the ordered shopping list SSL or list of special offers AD (by means of a corresponding key on the palm-top computer), the method passes to step 473 where the display module 365 correspondingly updates the array 355 or the array 360.

15 The method then passes to step 480.

Finally, if the customer has decided to postpone purchase of the current product to a later time, for example owing to a queue at the shelf, the method continues to step 475 where the current product is put on hold (by means of a corresponding key on the palm-top computer). The display module 365 correspondingly updates the ordered-shopping-list array 355 or the special-offers-list array 360. The method then passes to step 480.

25 If we now consider step 480, it is checked whether

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further products exist in the ordered-shopping-list array  
355 or in the special-offers-list array 360. If the  
answer is YES, the method returns to step 440. If the  
answer is NO, the method proceeds to step 485 where it is  
5 checked whether there are products on hold (both in the  
ordered-shopping-list array 355 and in the special-  
offers-list array 360). If the answer is YES, these  
products are restored to the normal state  
(correspondingly modifying the array 355 or the array  
10 360) and the method returns to step 440 in order to  
repeat the operations described above.

If the answer is NO, i.e. if there is no product on  
hold, the method continues to step 490 where the customer  
goes to the cash till in order to pay for the shopping  
15 (by means of cash, credit card or debit card); the  
information relating to the products purchased is also  
transmitted (by means of the driver modules 345 and 310)  
to the supermarket-management module 315 which  
correspondingly updates the respective field LOG of the  
20 customer database 325. The method then ends in the final  
step 495.

Similar considerations apply in the case where  
another equivalent method is used, error procedures or an  
escape function stopping execution of the various  
25 procedures are envisaged, the position of the products in

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the supermarket is defined by a different system of coordinates, or the shopping list is produced in a different manner. For example the products to be purchased are selected from a predefined list, are 5 inserted into the shopping list by reading the respective bar-code from an empty packaging, and the shopping list is supplied directly to the host computer, with connection thereto being effected via the Internet from home by means of a normal desktop or laptop computer; 10 alternatively, a preliminary list is produced automatically by the host computer on the basis of the products which are usually purchased by the customer; the customer completes the shopping list by simply erasing or adding products from/to this preliminary list.

15 More generally, the system according to the present invention is used for making purchases by a customer at a shopping centre of the self-service type; the system comprises means for storing the position of each product on sale in the centre, means for providing a shopping 20 list of products to be purchased, means for determining the position of each product to be purchased and means for providing the customer with an indication of the products to be purchased in an ordered sequence according to a path inside the centre.

25 The solution according to the present invention

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makes it extremely simple to locate, inside the centre, each product to be purchased as well as particular products which do not fall within a well-defined product category.

5 This allows the time required by the customer to carry out his shopping to be reduced drastically since the path followed by the customer inside the centre is optimized. Moreover, the solution described above avoids the situation where the customer forgets and therefore  
10 does not purchase a certain product.

The structure according to the invention also overcomes one of the main obstacles which prevent new customers from using the centre.

The particular embodiment of the present invention,  
15 as described above, offers further advantages. For example, the use of the palm-top computer which displays the name and the coordinate, inside the supermarket, of each product to be purchased is extremely efficient and flexible.

20 The generation of the ordered shopping list and subsequent sending thereof to the palm-top computer by the host computer of the supermarket reduces to a minimum the need for data transmission between the two computers and the processing power which is required of the palm-  
25 top computer.

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The fact that the palm-top computer displays in succession the information relating to each product to be purchased in response to various forward commands supplied by the customer (product purchased, erased or on hold) allows the customer to focus his/her attention on a single product at a time.

Moreover, the bar-code reader incorporated in the palm-top computer allows all the information relating to the products chosen by the user to be acquired in a rapid and precise manner.

Similar considerations apply in the case where the palm-top computer is removed from a rack at the supermarket entrance, with insertion of a magnetic card on which identification details of the client are stored, or the palm-top computer is replaced by a personal organizer, by a cellular phone (operating for example using a WAP or UTMS protocol) or by any other portable processing device, or the palm-top computer and the supermarket host computer communicate with each other in a different way (for example by means of a cable connection activated exclusively before the customer enters the supermarket) or the forward command is supplied by the customer in a different way (for example only via the keyboard, without the possibility of putting the current product on hold), and the like.

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The system according to the present invention in any case may also be implemented by supplying the customer with different information for each product to be purchased (even only the name), without using any 5 portable device (for example by providing the ordered shopping list printed on paper), without producing any ordered shopping list (sending the information relating to the products to be purchased from the host computer to the palm-top computer in an interactive manner), without 10 using any forward command (displaying the entire ordered shopping list in a window on the palm-top computer using an associated scroll bar), or without any bar-code reader (simply confirming purchase of the product chosen via the keyboard of the palm-top computer).

15 In the preferred embodiment of the present invention described above, the palm-top computer also displays any special offer associated with the current product to be purchased. This allows a very effective advertising campaign to be carried out precisely at the crucial 20 moment when the customer is purchasing the product.

Displaying the amount saved on the palm-top computer makes shopping more enjoyable for the customer and is an excellent stimulus for increasing the number of purchases.

25 By means of the list of special offers, together

with the associated products recommended to the customer on the basis of his/her personal details, it is possible to perform advertising which is specifically targeted at each customer.

5 In this case also, the fact of displaying the information relating to each recommended product when the customer is in the vicinity of the corresponding position further increases the effectiveness of the advertising.

Finally, the signalling lamps (which can be  
10 selectively activated by means of the palm-top computer) constitute a means which facilitates even further the location, inside the supermarket, of each product to be purchased.

Similar considerations apply in the case where the  
15 special offers are displayed in a different way (for example in a separate window on the palm-top computer), or the recommended products are determined in another manner (for example only on the basis of the products which are usually purchased or only on the basis of the  
20 personal details of the customer), or the position of the portable device is detected by means of a different system of sensors, or the signalling lamps are arranged on each level of the shelving or are replaced by acoustic warning devices, and the like.

25 The system according to the present invention may in

any case also be implemented without displaying either the special offers or the amount saved, displaying the information relating to the recommended products independently of the customer's position or even without 5 producing any list of recommended products and without any signalling device.

Alternatively, only some of these functions (or even none of them) or functions of another type are envisaged, such as the displaying of a number of loyalty points 10 accumulated by the user and the corresponding prizes reached, the transmission of short advertising messages to the palm-top computer (if necessary of the type personalized for the customer), the possibility of paying for the purchases automatically (on the basis of the 15 information collected by the palm-top computer), and the like. Conversely, these additional functions may be used (separately or in combination with each other) also without the above mentioned function of indicating the products to the purchased in an ordered sequence 20 according to the path inside the supermarket.

Obviously a person skilled in the art, in order to satisfy contingent and specific requirements, may make numerous modifications and variations to the solution described above, all of which moreover are contained 25 within the scope of protection of the invention as

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defined by the following claims.

## CLAIMS

1. System (100) for making purchases by a customer at a shopping centre of the self-service type (105), comprising means (330) for storing the position of each product on sale in the centre, means (135) for providing a shopping list of products to be purchased,

characterized in that

the system further comprises means (320) for determining the position of each product to be purchased and means 10 (135) for providing the customer with an indication of the products to be purchased in an ordered sequence according to a path (120) inside the centre.

2. System (100) according to Claim 1, wherein the means for providing the customer with an indication of 15 the products to be purchased include a portable processing device (135) having means (275) for displaying a name and a coordinate, inside the centre, of each product to be purchased.

3. System (100) according to Claim 2, wherein the 20 means (330) for storing the position of each product on sale and the means (320) for determining the position of each product to be purchased include a computer of the centre (130), the computer further comprising means (320) for producing an ordered shopping list according to the 25 path and comprising, for each product to be purchased,

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the corresponding name and the corresponding coordinate,  
and wherein the system comprises means for communication  
(310,345) between the computer and the portable device,  
the ordered shopping list being sent from the computer to  
5 the portable device.

4. System (100) according to Claim 2 or 3, wherein  
the portable device comprises means (365-375,385) for  
displaying in succession the indication of each current  
product to be purchased in response to a forward command.

10 5. System (100) according to Claim 4, wherein the  
portable device includes a bar-code reader (290) for  
producing the forward command in response to the reading  
of a bar-code for the current product to be purchased,  
chosen by the user.

15 6. System (100) according to Claim 4 or 5, wherein  
the computer comprises means (330) for storing a possible  
special offer associated with each product on sale and  
means (320) for adding the corresponding special offer to  
each product to be purchased in the ordered shopping  
20 list, the portable device further displaying the special  
offer corresponding to the current product to be  
purchased.

25 7. System (100) according to Claim 6, wherein the  
special offer includes a discount applied to a price of  
the product on sale and wherein the portable device

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comprises means (365,380) for determining an amount saved equal to the sum of the discounts corresponding to the products to be purchased chosen by the user, the portable device further displaying the amount saved.

5        8. System (100) according to any one of Claims 1 to 7, wherein the computer comprises means (325) for storing information relating to the customer and means (320,325) for producing an additional list containing an indication of recommended products depending on the  
10 information relating to the customer, the additional list being sent to the portable device and the portable device further displaying the indication of the additional products.

15        9. System (100) according to Claim 8, wherein the additional list includes, for each recommended product, the corresponding name and the corresponding coordinate and wherein the system further comprises means (119,345) for detecting a position of the portable device, the portable device displaying the indication and the  
20 coordinate of the recommended product when the portable device is in the vicinity of the corresponding position.

25        10. System (100) according to any one of Claims 1 to 9, further comprising signalling means (118) for indicating a zone in which the current product to be purchased is located, the portable device comprising

means (285) for selectively activating the signalling means.

11. Method (400) for making purchases by a customer at a shopping centre of the self-service type, comprising  
5 the steps of:

storing a position of each product on sale in the centre,

providing (410-420) a shopping list of products to be purchased,

10 characterized by the steps of  
determining (425) the position of each product to be purchased, and

supplying (450) the customer with an indication of the products to be purchased in an ordered sequence  
15 according to a path inside the centre.

12. Method (400) for making purchases by a customer at a shopping centre of the self-service type, comprising, under the control of a computer of the centre in which the position of each product on sale in the centre is stored, the steps of:

receiving (420) a shopping list of products to be purchased,

determining (425) the position of each product to be purchased, and

25 providing (450) the customer with an indication of

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the products to be purchased in an ordered sequence according to a path inside the centre.

13. Computer program (320) directly loadable into a working memory of the computer of the centre for 5 performing the method of claim 12 when the program is run on the computer of the centre.

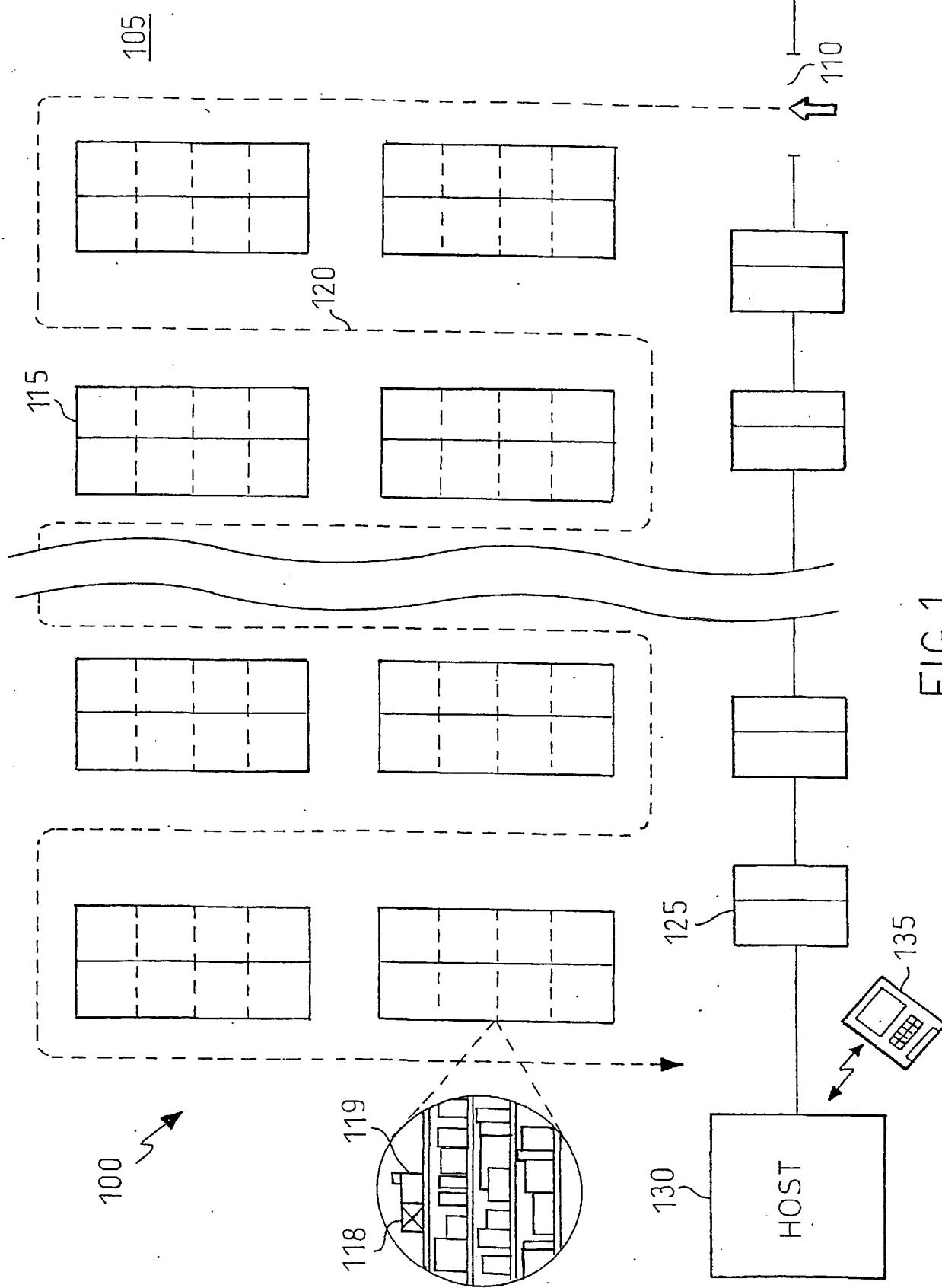
14. Program product comprising a computer readable medium (235) on which the program of Claim 13 is stored.

ABSTRACT OF THE DISCLOSURE

System (100) for making purchases by a customer at a shopping center of the self-service type (105), including a device (330) for storing the position of each product on sale in the center and a device (135) for providing a shopping list of products to be purchased. The system further includes a device (320) for determining the position of each product to be purchased and a device (135) for providing the customer with an indication of the products to be purchased in an ordered sequence according to a path (120) inside the center.

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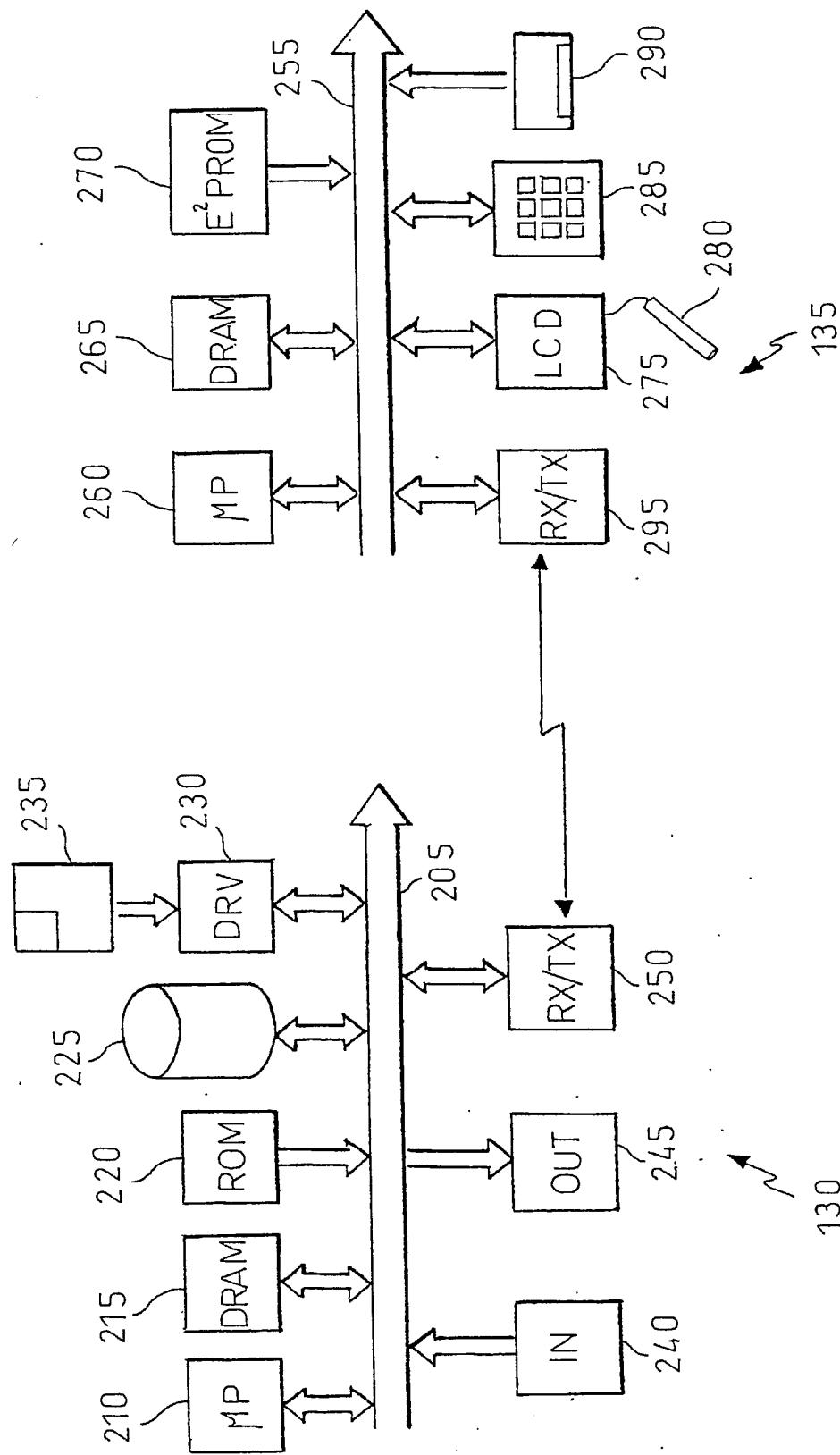


FIG. 2

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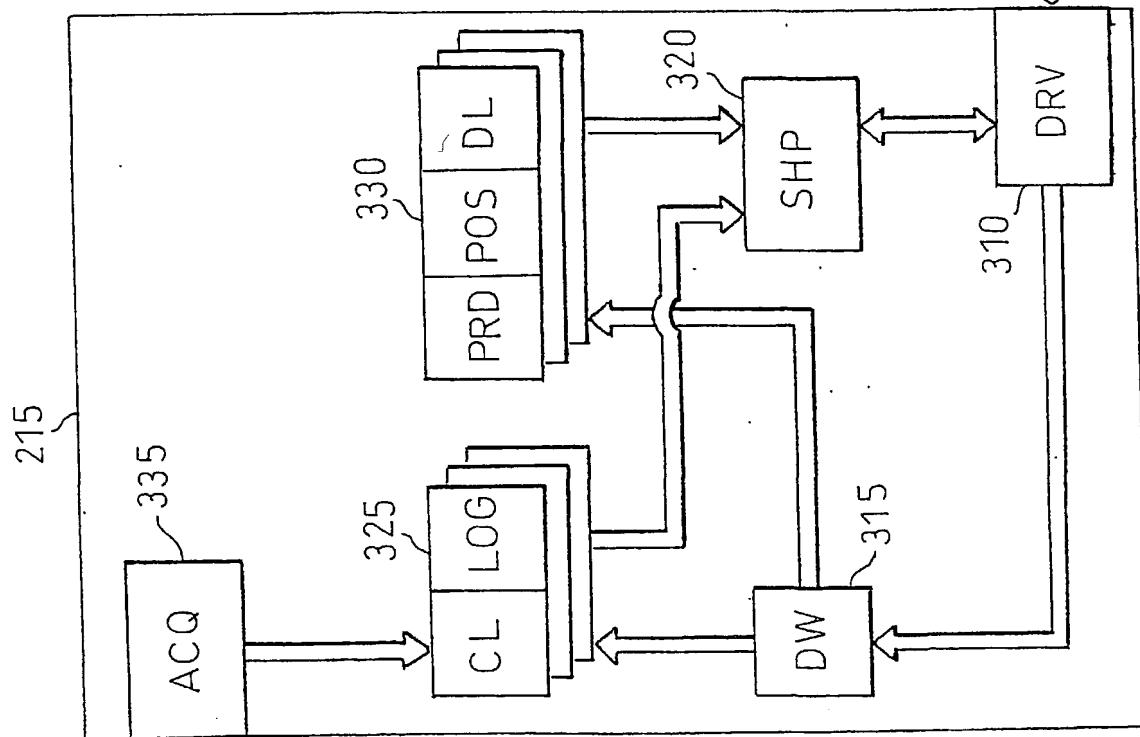
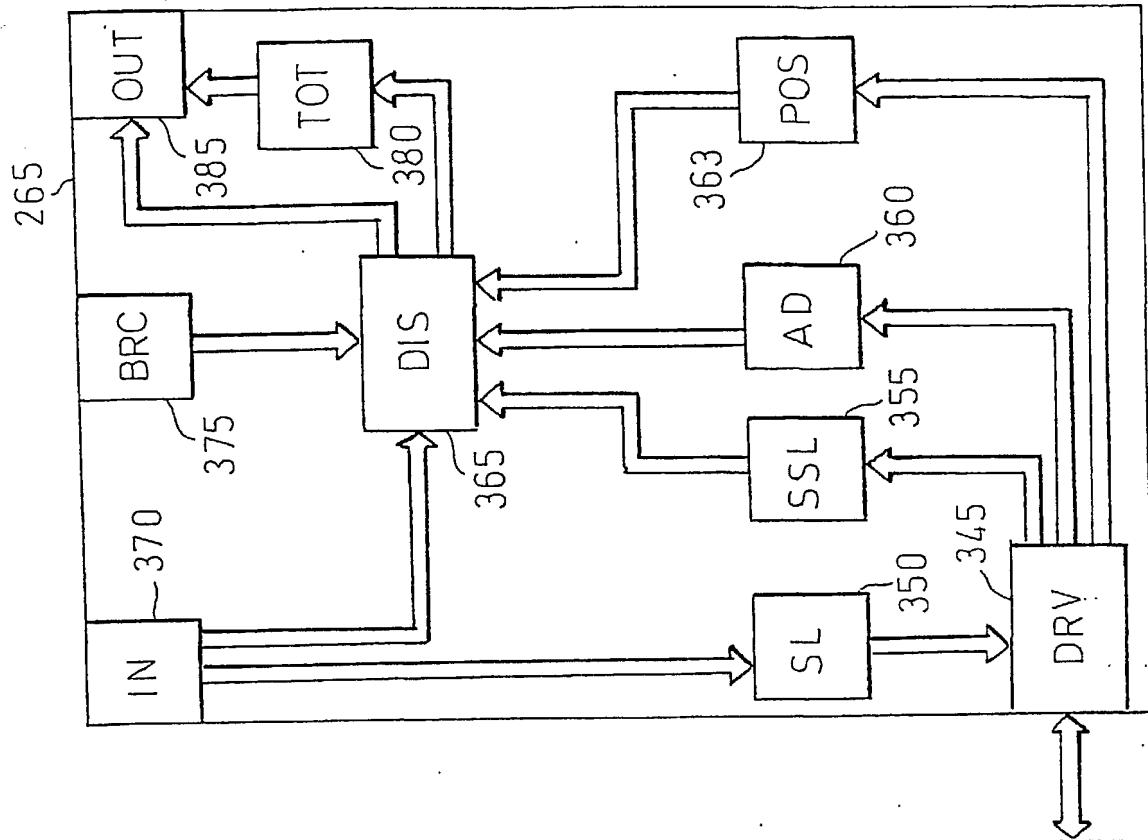


FIG. 3

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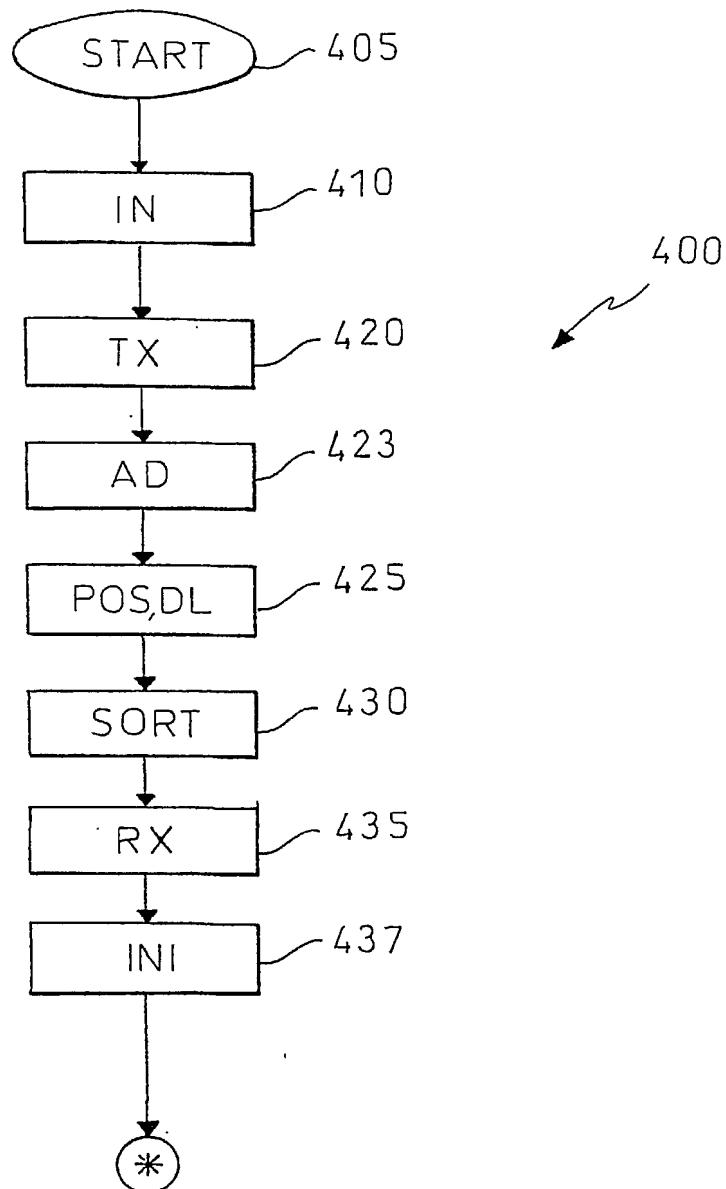


FIG. 4a

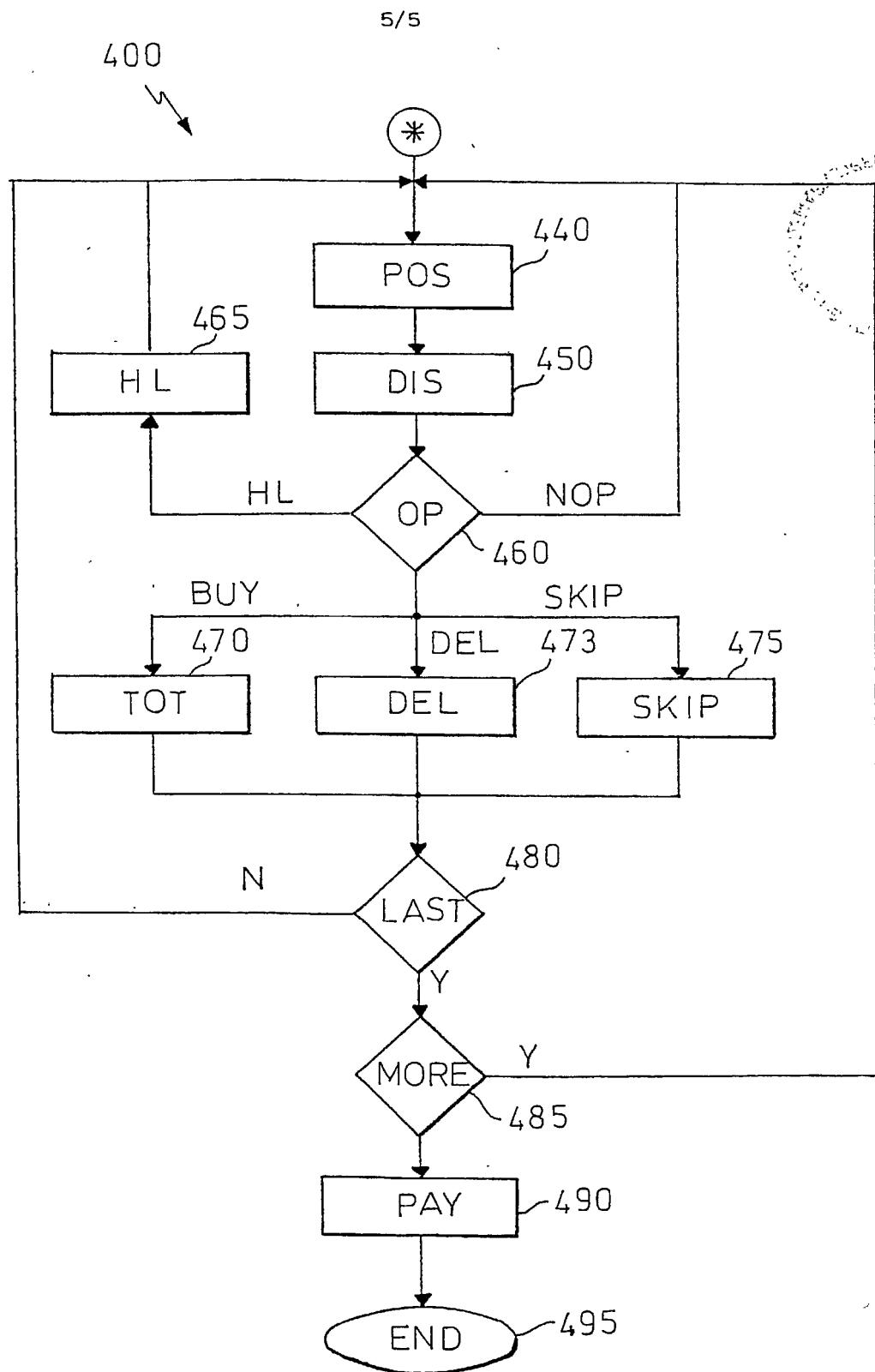


FIG. 4b

## **COMBINED DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **SYSTEM FOR MAKING PURCHASES AT A SHOPPING CENTRE OF THE SELF-SERVICE TYPE**

the specification of which: (check one)

## **REGULAR OR DESIGN APPLICATION**

- is attached hereto.

was filed on March 20, 2002 as application Serial No. 10/088,475  
and was amended on \_\_\_\_\_ (if applicable).

**PCT FILED APPLICATION ENTERING NATIONAL STAGE**

- was described and claimed in International application No. PCT/IT00/00304 filed on July 20, 2000 and as amended on \_\_\_\_\_(if any).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, §1.56

## PRIORITY CLAIM

I hereby claim foreign priority benefits under 35 USC 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

**PRIOR FOREIGN APPLICATION(S)**

Country	Application Number	Date of Filing (day, month, year)	Priority Claimed

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional patent application(s) listed below:

Application No. Filing Date Status (patented, pending abandoned)

*(Complete this part only if this is a continuing application.)*

I hereby claim the benefit under 35 USC 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 USC 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application No. Filing Date Status (patented, pending abandoned)

## POWER OF ATTORNEY

The undersigned hereby authorizes the U.S. attorney or agent named herein to accept and follow instructions from **MACCALLI & PEZZOLI** as to any action to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

As a named inventor, I hereby appoint the registered patent attorneys represented by Customer No. 000466 to prosecute this application and transact all business in the Patent and Trademark Office connected therewith, including: Robert J. PATCH, Reg. No. 17,355, Andrew J. PATCH, Reg. No. 32,925, Robert F. HARGEST, Reg. No. 25,590, Benoît CASTEL, Reg. No. 35,041, Thomas W. PERKINS, Reg. No. 33,027, Roland E. LONG, Jr., Reg. No. 41,949, and Eric JENSEN, Reg. No. 37,855,

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Inventor's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Full name of third joint inventor, if any:

Inventor's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Post Office Address: \_\_\_\_\_

Full name of fourth joint inventor, if any:

Inventor's signature: \_\_\_\_\_ Date: \_\_\_\_\_

Residence: \_\_\_\_\_ Citizenship: \_\_\_\_\_

Post Office Address: \_\_\_\_\_